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# **Heterogeneity and participation in Informal employment among non-cultivator workers in India**

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**Abstract**

*Labour informality is one of the most serious challenges for the world and more so for developing economy like India with large scale poverty and little unemployment protection. The provision of decent working conditions becomes prerogative bringing the issue of labour informality into the forefront. This study scrutinized possible heterogeneity within informal employment among the non-cultivator workers in India. It has studied the trend, pattern, and determinants of the various components of the informal employment. It found significant heterogeneity within the informal employment with respect to poverty, age, gender, socio-religious communities, educational attainment, and industrial classification. . Complexity of heterogeneity in informal employment has been rising over time, hence posing serious policy challenges. Cluster analysis carried out to demonstrate the relationship between informality in employment and quality of works. The evidence suggests significant diversity within the informal employment. Multinomial logit was applied to determine the determinants of participation in informal employment. The result further reinforces the complexity in informal employment. The convolution is more with respect to rural and urban area, dependency ratio, marital status, social groups, and poverty. With respect to education the dual market hypothesis was supported. Co-existence of voluntary and involuntary informal employment was also observed. Given the diversity of employment, the paper suggests specific policy design for different segment of employment to achieve equitable and inclusive growth.*

*Key Words:* Labour Market Informality, Quality of Work, Cluster Analysis, Heterogeneity, Multinomial Logit.

JEL Classification: J46; J80; C35; C38

1. INTRODUCTION

In the new millennium India has achieved remarkable growth rate in Gross Domestic Product, particularly after 2004 – which is unprecedented in her history. At the same time it has witnessed a rising inequality without inter-personal or inter-caste/class inclusiveness in growth (Subramanian and Jayaraj, 2015). It is argued that growth with equality is possible under the condition of decent work (Heymann and Earle, 2010). In the domain of decent work – formal and informal- employment is the most critical component. Better and quality employment opportunities for the current generation will provide level playing field for future generation, which is the need of the hour, given rising inequality. But the traditional full time jobs being replaced by non-standard employment pose serious challenges in this regard (Atkinson, 2015) Labour informality became a very pertinent issue in the current development debate. Its importance is even more in a developing country like India with a significant section of the population living below the poverty line and meagre public provisions for unemployment insurance. This makes unemployment a very unviable alternative for a common man and he is forced to take up whatever opportunities that come his/her way. In such a scenario looking at the overall unemployment rates doesn't provide a very informative picture of the labour market in the country, as a large section of such employment is likely to be of a bare subsistence nature, and this in fact the case is. Unemployment is a unreliable yardsticks to measure distress in labour market (Fields, 2011a; 2011b), because unemployment rate is high in developed countries than developing countries (International Labour Organisation (ILO), 2015). Hence, it is central to look at the quality of work of the employed which brings labour informality to the forefront.

Labour informality as a concept has a history going back to the 1970s. Keith Hart, a British ethnographer is credited it. and He coined the term 'informal sector'. At about the same time, ILO launched a number of studies on this phenomenon in Africa (Jütting, Parlevliet, and Xenogiani, 2009). The early conceptualisation of the concept highlighted the informal economy as a residual sector distinct from the formal economy (Lewis, 1954; Harris and Todaro, 1970). In the late 1980s, the structuralist school highlighted the close relation between the formal and the informal economy. Still others have emphasized on the role of institutional bottlenecks in creating the incentives to work informally (Chen, 2012). It should be noted that informal economy and informal employment are not

the same, though closely related. We have used the term informality to denote informal employment, and for sectors we have used organised and unorganised.

Examining informal employment in India researchers have dichotomised labour market to informal and formal segment thereby implicitly assuming homogeneity in informal employment (Mehrotra et al 2012 and 2013; NCEUS, 2007; Sastry, 2004). However, existing literature suggested two contested issues i.e. whether informal employment is voluntary or involuntary in nature (Kucera and Roncolato, 2008; Fields 2011a; 2011b), thereby suggesting possible heterogeneity within informal employment. Although there are diversified opinion on the drivers of informality, we can put the different views under two broad groups - informality by choice and informality as exclusion (Perry et al 2007).

The former premise emphasize the voluntary nature of informality as workers engage in informal work to escape burdensome government taxes and regulations involved in working formally (Fields, 1990, 2005b; Maloney, 1999 and 2004; Maloney and Bos, 2007). However it may not be true in case of India (Fields, 2005a). The possible voluntary nature of informal employment may not be only for upper tier jobs but it may also valid for lower tier jobs, particularly in Indian context. This may be due to given endowments set of poor individuals, even if they find a job in formal sector the reward for them will be very low compared to informal employment. For instance, one poor individual has only about primary schooling (five years of schooling) and find a job in formal sector, what will be the wage for that individual given the fact that there are so many low skill set workers are looking for same type of jobs? It is highly likely that she/he may get the subsistence wage in the formal sector. Therefore, it will be better off for her /him to join the informal sector.

On the other hand, the later premise stress the marginal nature of the phenomenon as workers in the absence of decent jobs and unemployment protection are forced to take up job in the informal sector (Chen, Vanek, Lund, Heintz, & Christine, 2005; Cassirer and Addati, 2007). Some authors take a more nuanced view contending that both the forms of informality may persist in an economy in varying degrees (De Mel, McKenzie, and Woodruff, 2008; Perry et al., 2007; Gindling and Newhouse, 2014), and particularly true for women (Maloney, 2004). Hence, looking at informal employment from an aggregate point of view without considering its sub-categories is not likely to

give much information on the diversity within the informal sector. Therefore we intend to study the trends in and determinants of the various sub-categories of informality with reference to the formally employed. This will shed more light on dynamics within the informal sector. Most of the literature in this issue, to the best of our knowledge, deals with Latin America, Europe and Sub-Saharan countries. There is hardly any literature available on South Asian developing countries, and particularly on India. The present study examines the heterogeneity within informality for the non-cultivator workforce in India. Then it has linked it with different individual, household, regional, and industrial characteristics. In addition, the study has examined the relation with heterogeneity in informal employment with quality of work. It has attempted to examine determinants of participation (i.e. individual characteristics, household socio-economic status, and industrial classification) in informal employment compare to formal employment.

The study has used information on social security benefits, work status, and organised-unorganised sectors to make the distinction between formality and informality. Workers are differentiated based on the quality of work of the working population by considering set variables such as nature and skills of the job, income afforded by it apart from availability of social security benefits. Our analysis reveals that the Indian labour market is highly informal and there are two distinct sections of informal employees- informal wage employed and informal self-employed- apart from a distinct cluster of formal workers. The preceding exercise revealed considerable diversity within the informal employed especially between the self and wage employed. This has emphasized the heterogeneity within the informal economy.

The paper is divided into four sections. Section 2 discusses the data and the methodology. Section three discusses the results of the study including the descriptive statistics, cluster analysis and multinomial logistic analysis. Section 4 provides the conclusions and dwells on some policy suggestions.

## **2. DATA SOURCES AND METHODOLOGY**

The study has used unit level data from the National Sample Survey Organisation (NSSO) Employment-Unemployment Survey (EUS) for two time periods 2004-05 and 2011-12. The sample size is representative at both national and sub-national (state) level. The EUS for the two rounds contains information on the enterprise size and the availability of social security benefits of the workers. It also has information on other variables depicting quality of work such as union membership, regularity of job etc. We utilise this information to distinguish workers into the formal and informal segment. Further, it provides individual and household level information which we utilise for further analysis. The study defines organised and unorganised sectors based on (1) workers in the enterprise, and type of enterprise;; and (2) in employment considering the presence of social security benefits, work status, and organised and unorganised sectors.. Details are provided in Appendix-1.

Efforts to generate statistics on the informal economy at a national level led to the definition of the informal sector by the 15<sup>th</sup> International Conference on Labour Statisticians (ICLS) as consisting of small-scale unincorporated units with low level of capital and organisation and characterised by non-contractual employment arrangements without formal protection. However, such an enterprise based definition of the informal economy was criticised on the ground that it excluded a large and growing section of precarious employment engaged in formal enterprises. Hence, the Delhi Group along with ‘Women in Informal Employment: Globalizing & Organizing’ (WIEGO) concluded that the enterprise based definition needs to be complemented by an employment based criterion. In line with these efforts, the ILO as part of its Report ‘Decent Work and the Informal Economy’ suggested a conceptual framework for defining and measuring the informal economy which was finally ratified by the 17<sup>th</sup> ICLS(ILO, 2002). The 17<sup>th</sup> ICLS defined informal employment as the total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households, during a given reference period.

The definitional and statistical issues relating to the informal economy in India was conducted by the ‘National Commission for Enterprises in the Unorganized Sector’(NCEUS) using NSSO

data(NCEUS, 2008). We have used the NCEUS methodology modifying it suitably for our purpose of classifying workers into the formal and informal. The study has agglomerated the three view of informality i.e. job based (ICLS, 2003), social security based (Bacchetta et al 2009, NCEUS, 2007), and characteristics of production units (Luebker, 2008; NCEUS, 2007) to define informal employment. We carry out our analysis excluding the cultivators as information on availability of social security benefits as well as enterprise type or number of workers in the enterprise is not available for such workers. Moreover, the meaning and distinction of different type of informality in agriculture and non-agriculture may differ. Particularly in the context of cultivators the meaning of self-employed, own-account worker and employer, and unpaid family worker is different than those non-cultivator workers (Gindling and Newhouse, 2014). Hence, our analysis is for the non-cultivation workforce in the economy.

The study distinguished workers based on the quality of their work using a larger set of indicators. The relevant variables considered are presence of social security benefits, duration of written job contract, eligibility for paid leave, regularity of wages, skill level of the job, union membership, on the job training, and status of employment (part-time/fulltime; regular/irregular and permanent/temporary). Cluster analysis is applied to distinguish workers based on their quality of work. Cluster analysis create distinct clusters of observations using various distance measures of the attributes of the observations so that intra-cluster observations are as similar as possible whereas inter-cluster observations are as dissimilar are possible (Johnson and Wichern, 2014). Since, all but one of our variables is categorical in nature traditional methods such as hierarchical or k-means clustering was not very appropriate for this purpose. Hence, Two-Step-cluster analysis method is used on these variables to arrive at some distinct clusters of workers(SPSS, 2009, Johnson and Wichern, 2014).The two-Step-cluster analysis method consists of two stages: The first step of the two-step procedure is formation of pre-clusters. It reduces the size of the matrix that contains distances between all possible pairs of cases. When pre-clustering is complete, all cases in the same pre-cluster are treated as a single entity (SPSS, 2009; Johnson and Wichern, 2014). In the second step, the standard hierarchical

clustering algorithm on the pre-clusters is used. Since the number of pre-clusters is much less than the number of original records, traditional clustering methods effectively is applied (SPSS, 2009).

The two-step method uses the log-likelihood as the distance measure which can handle both continuous and categorical data. Under this method, we define the distance between two clusters as the corresponding decrease in log-likelihood by combining them into one cluster. Number of clusters is determined by Bayesian Information Criteria. "Goodness" of a cluster solution is gauged by silhouette coefficient, which is a measure of both cohesion and separation. The silhouette coefficient lies between -1 to +1 with a value of 1 being best and a value of minus 1 being worst. A silhouette coefficient of more than 0.2 is considered fair (SPSS, 2009; Johnson and Wichern, 2014).

Internal heterogeneity within the informal employment is examined by dividing the informal employment into five distinct categories on the basis of usual status of the workers i.e on the job based. The categories are – informal own-account workers, informal employers, informal unpaid family workers, informal regular workers and informal casual workers. The formal economy is taken as a single category. Hence, in all we have six distinct categories including the formal employed. In order to study the trends of the different categories of informality we evaluate simple descriptive statistics. We conduct multinomial logistic analysis to study the determinants of the different components of informal employment.

The literature suggests a number of determinants of informality among them being age, years of education, technical education, household income, religion, social group, gender, marital status, sector and industry (Henley, Arabsheibani, & Carneiro, 2009; Yu, 2012; Angel and Kimie, 2012; Lehmann and Zaiceva, 2013). We consider the impact of these variables on informality in our model. We include both age and its square in our model as we hypothesize a quadratic relation of age with informality. However, taking both age and its square creates the problem of multicollinearity. Hence, we deduct mean of age from age and take the demean age and its square in our model which solves our multicollinearity problem. Similarly, in order to bring out the effect of education we utilise the information on the education status of workers. Rather than taking dummies for different educational levels we derive a continuous variable depicting the mean years of education of the workers. The



methodology used to arrive at this variable is discussed in the Appendix-2. In order to capture the effect of technical education on informality, we take a dummy for the presence or absence of technical education in our model. Monthly Per-Capita Consumption Expenditure (MPCE) of the household is taken as a proxy for household income and to capture poverty. We have taken the natural logarithm of MPCE. We also look at the incidence of poverty across various poverty groups. The derivation of poverty classification is discussed in the Appendix-3.

Two social stratification variables are included in our model: religion and caste. We consider three broad religions for our study- Hindu, Islam and 'Others' which includes all other religions. We include separate dummies for all the religions except Hindus which we take as the reference category. Similarly, we create separate dummies for the social groups excluding 'Others (usually known as general caste)' which we consider as the reference category. We also have separate dummies for gender (male/female) and rural-urban.. We interpret our results taking females and urban as the reference categories respectively. Similarly, for marital status we divide the workforce into two groups- never married and married where all currently married, divorced and widowed workers are clubbed together into a single category. We interpret our results against the base category of never married workers. Finally, we also include dummies for the industrial affiliation of the workers. The industrial affiliation of the workers can be obtained from the National Industrial Classification code of the respective workers available in the NSSO data. We divide workers into seven broad industries viz. 'Agriculture' (excluding cultivators); 'Mining, Electricity & Water Supply'; 'manufacturing'; 'Construction'; 'Trade, Hotels & Transportation'; and 'Finance, Insurance & Real Estate'. We create separate dummies for all the above industries except for 'Trade, Hotels & Transportation' which is the reference category.

As mentioned earlier, we have six alternatives (formal labour, informal self-employed, informal employer, informal unpaid family worker, informal casual, and informal regular workers). Therefore, multinomial categorical variable model is applied to examine the characteristics that determine participation. Following Cameron & Trivedi (2005), Madala (1983), and Wooldridge (2010) the

dependent variable is defined to take the value  $j$  if the  $j^{\text{th}}$  alternative is taken,  $j= 1, 2, 3, 4, 5$ , and  $6$ . We define that alternative  $j$  is chosen as,

$p_j = \Pr[y=j]$ ,  $j= 1, 2 \dots 6$ . We introduce six binary variables for each observation  $y$ ,

$$y_j = \begin{cases} 1 & \text{if } y=j \\ 0 & \text{if } y \neq j \end{cases} \quad \text{-----} 1$$

Thus  $y_j$  equals one if an alternative  $j$  is the observed outcome and the remaining  $y_k$  equal zero ( $j \neq k$ ), so for each observation on  $y$  exactly one of  $y_1, y_2, \dots, y_6$  will be non-zero. The multinomial density for one observation can then be conveniently written as,

$$f(y) = p_1^{y_1} * p_2^{y_2} * \dots * p_6^{y_6} = \prod_{j=1}^6 p_j^{y_j} \quad \text{-----} 2$$

For our regression model, we introduce a subscript  $i$  for the  $i^{\text{th}}$  individual and regressors  $x_i$ , where  $x_i$  is a  $1 \times k$  vector of explanatory variables. The probability that the individual  $i$  choose the  $j^{\text{th}}$  alternative is given by,

$$p_{ij} = \Pr[y=j] = \frac{\exp(x_i' \beta_j)}{\sum_{l=1}^6 \exp(x_i' \beta_l)}, j = 1, 2, \dots, 6 \quad \text{-----} 3$$

and  $\beta_j$  is a  $k \times 1$  vector of regression coefficients.

Because,  $\sum_{j=1}^6 p_{ij} = 1$ , we impose the restriction that  $\beta_1 = 0$ . We apply the Maximum Likelihood method to obtain the regression coefficients. The likelihood function for a sample of  $N$  independent observations is,

$$L_N = \prod_{i=1}^N \prod_{j=1}^6 p_j^{y_{ij}} \quad \text{-----} 4$$

The log-likelihood function (LLF) is

$$L = \ln L_N = \sum_{i=1}^N \sum_{j=1}^6 y_{ij} \ln p_{ij}, \quad \text{-----} 5$$

The Maximum Likelihood method involves differentiating the LLF with respect to the unknown  $\beta$ 's so that the probability of obtaining the actual  $y$ 's is as high as possible. In our Multinomial Logit model, we arrive at the following equations

$$\frac{\partial L}{\partial \beta_k} = \sum_{i=1}^N (y_{ik} - p_{ik}) x_i = 0, k=1,2,\dots,6. \text{ -----6}$$

Solving (6) would give us our regression coefficients. For better interpretation of the regression coefficients we have

$$\frac{Pr[y_i=j]}{Pr[y_i=1]} = \exp(x_i' \beta_j) \text{-----7}$$

Hence,  $\exp(\beta_{jr})$  gives us the change in the probability of choosing the category  $j$  compared to the alternative 1 when  $x_{ir}$  changes by one unit. This is the relative risk ratio or the odds ratio as in the binomial logit model. The coefficient interpretation is then identical to the binomial logit model.

### 3. RESULTS AND DISCUSSION

#### a. Trends and Patterns of components of Informality

One of the objectives of this study is to examine the incidence of informal employment heterogeneity, and its trends and patterns in India. Before observing the patterns in employment across various components of informality, we have looked at the aggregate representation of informality in India over time. Informal employment in India is very high (Mehrotra, et al 2013, Kannan, 2009, NCEUS, 2007). The percentage of informality in employment in total workforce (including cultivators) was about 93.8 percentages in 2004-05 but has declined placidly to 92.5 percentages by 2011-12. However, in absolute term there is a rise. In addition to this informal employment in organised sector has been rising causing informalization of formal sector (Mehrotra, et al 2013).

Table 1: Labour Informality among Non-cultivator workers in India						
Year	2004-05			2011-12		
Employment Sector	Formal	Informal	Total	Formal	Informal	Total
Organised	49.43	50.57	24.82	42.46	57.54	31.58
Unorganised	0.82	99.18	75.18	1.37	98.63	68.42
Total	12.88	87.12	100	14.35	85.65	100
Source : Authors' calculations based on NSSO data						

Labour informality among non-cultivator workers in India has seen a slight decline from around 87 per cent to 85 per cent (Table 1). Similarly, we observed a significant fall in unorganised sector employment from around 75 per cent to about 68 per cent. At the same time, there has been a drastic rise in informal employment within the organised sector suggesting a trend of casualization of jobs within the organised sector as in recent years many public and private sector firms are employing people under non-standard employment contracts without social security benefits. This has severe consequence on workers, as informal workers in the formal sector are the first one to be retrenched in the event of the any adverse economic condition.

Table 2: Informality rates among Non-cultivator workers across Employment Categories		
Employment Categories	Year	
	2004	2011
Formal workers	13.15	14.68
Informal Own-account workers	35.52	32.1
Informal employers	1.15	1.21
Informal unpaid family workers	15.37	9.05
Informal regular workers	16.18	17.8
Informal casual workers	18.63	25.17
Source : Authors' calculations based on NSSO data		

Considering the proportion employed in the various worker categories, we have found formal workers share has increased by over 1.5 percentage points (13.2 to 14.7) in the last several years , when India has witnesses the highest economic growth, particularly in the non-agriculture sector. This is in line with the Lewisian process, where as an economic progress workers move from informal sector to formal sector. Own-account workers constitute the biggest component of the labour force at around 35 per cent of the workers employed in the category. The concentration of unpaid workers, informal

regular and casual workers is similar between 15 to 18 per cent. Informal employers constitute the smallest segment of the workforce with around 1 per cent of the workers (Table 2). The structure of the workforce is similar for 2011-12. However we see a significant reduction in the proportion of the workforce among the unpaid family workers and at the same time a drastic rise in the proportion employed among casual workers. The decline in share of informal self-employed (own-account and unpaid family labours) over the years is concentrated among the poor and very poor (Table 4), suggesting thereby unsuccessful nature of self-employment.

Further, it seems the fall in the informal self-employed is majorly absorbed in informal casual workers, which is mainly in the construction sector. Hence it emerges that many informal self-employed are moving to construction sector as daily wage earners. It suggests, in India informal self-employed is rationed out of the wage job market as is found for Sri Lanka by de Mel, McKenzie, and Woodruff, (2010) and for Latin America by Tokman (2007), and waiting for right salaried job to shut down their business (Banerjee and Duflo, 2007). Informal employers share has increased very marginally. This is a combined effect of fall in share of very poor, poor and marginal informal employers, and rise in middle class and above categories. Further collaborating above findings of informal employment in India at large is rationed out of the wage job market. Next, we have examined the dynamics of informality across ages.

Table 3 : Informality among Non-cultivator workers across age groups (percentage)							
Employment Categories	Year	Age Groups					
		Less than 16	16-25	26-35	36-45	46-60	61 and above
Formal Workers	2004-05	0.14	7.62	26.81	33.32	31.71	0.4
	2011-12	0.03	10.85	29.79	29.11	29.55	0.66
Informal Own-account workers	2004-05	1.14	15.64	30.09	27.54	19.79	5.8
	2011-12	0.44	10.79	28.32	30.12	23.97	6.36

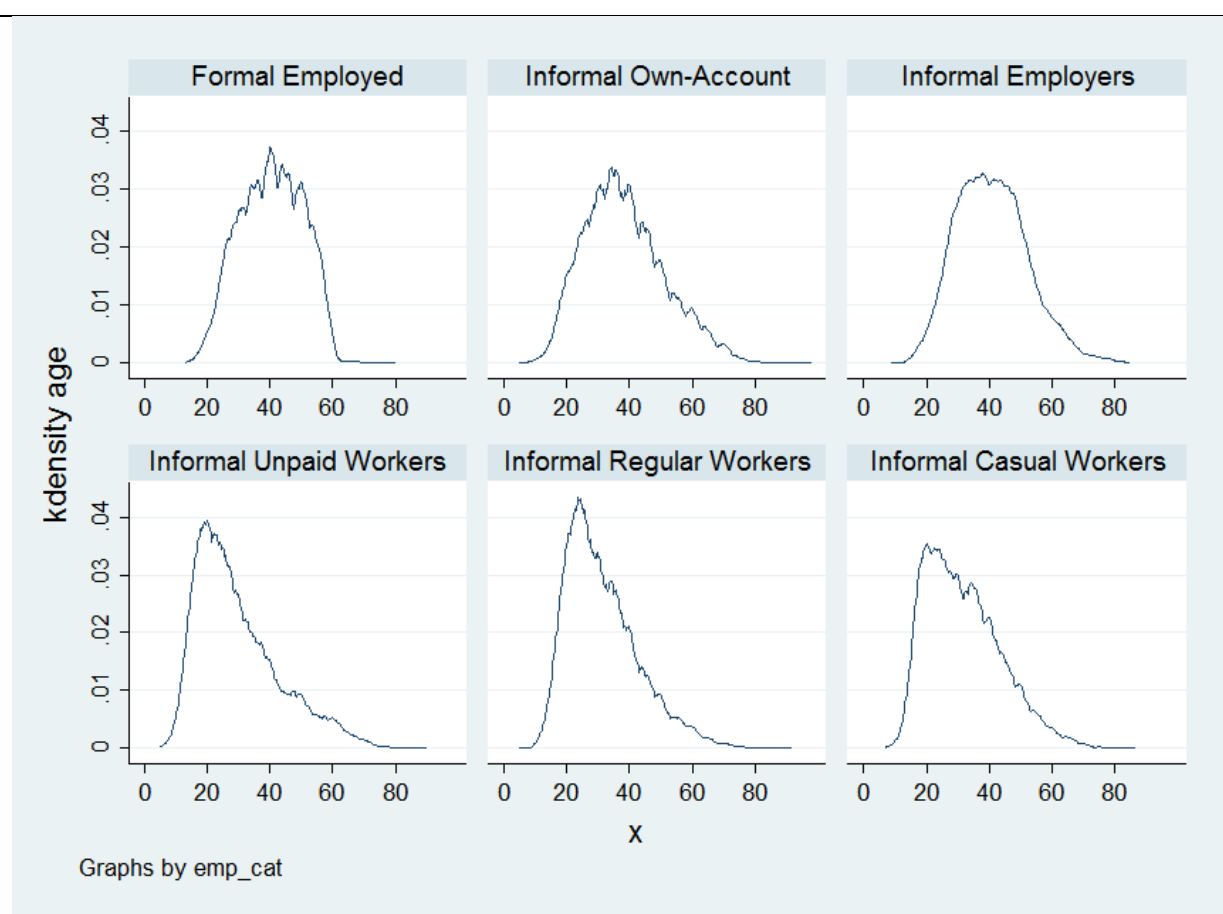
Informal Employers	2004-05	0.01	7.04	28.27	32.74	26.82	5.11
	2011-12	0.01	6.87	25.8	34.1	23.88	9.35
Informal Unpaid Family Workers	2004-05	10.08	37.58	25.04	13.7	10.71	2.89
	2011-12	5.7	38.01	28.43	14.6	10.25	3.01
Informal Regular Workers	2004-05	2.81	34.9	32.36	18.49	9.58	1.86
	2011-12	1.42	28.88	34.46	21.92	11.31	2
Informal Casual Workers	2004-05	3.68	33.66	29.42	20.51	11.05	1.69
	2011-12	1.82	26.01	30.01	23.55	15.59	3.04
Total	2004-05	3.11	24.33	29.1	23.46	16.76	3.23
	2011-12	1.37	20.26	30.03	25.5	19.18	3.65
Source : Authors' calculations based on NSSO data							
Note: Row total is add up to 100 percent							

Workers age reflects an amalgam of the on-the-job-skills of the workers, his experience over the years as well as his social contacts accumulated; and workers/individual at younger aged may prefer to take more risk and hence may work in informal sector. It is possible that over the years he/she may moves to formal sector. Hence, the relation of informality with age might give us an inkling of the possible lifecycle dynamics of the workers as workers move between jobs over the lifetime. Looking at the incidence of informality across various age groups we find that the concentration of unpaid family workers is quite high among children below age 15 compared to the other groups. We also find a decent concentration of child workers among informal regular and casual workers. However, the prevalence of child labour, particularly unpaid family workers has declined significantly in 2011-12. This is probably due to implementation of Righty to education Act- which calls for free and compulsory education for children below 14 years of age. Further, government provision of Mid-Day-Meals, free books, and free dress for children increases the children reservation wages thereby dropping from labour force. In the context of informal family workers for age groups 16 and above, share has increased. This is may be due to rise in unpaid family workers of women, as after marriage

or school, given the socio-economic-political constrained faced by female they prefer to work from home. This is substantiated by the fact that, share of unpaid family workers for female has been increasing whereas for male it is declining (Table-6)

Among the formal workers, young workers share has been increasing, suggesting higher propensity of young workers to move from informal to formal employment, similarly to the finding of Lehmann and Pignatti (2007) for Ukrain. However, it is puzzling to observed (contradictory to and Pignatti, 2007) that the workers aged between 36-60, when they should be looking for a better and settle job in terms of formal employment their share has been falling. This decline is commensurate to the effect of ascendancy in informal workers in own-account and employers. The rise in share of the latter two categories in concentrated among the relative affluent section of the society (Table 4), suggesting that individuals from relatively higher income households are entering the labour market through formal employment and after they gained some practical experience leaving the formal job to start their own business or to work in the family business.

Figure 1 : Age distribution Non-cultivator workers across employment categories (2011-12)



Source : Authors' calculations based on NSSO data

Between ages 16 to 60, we found that there was a steady increase in the workforce employed among the formal workers, own-account workers and informal employers. Among the other categories viz. unpaid family workers, informal regular workers and casual workers, proportion employed is significantly higher in the younger age groups 16-35 before tapering off in the older ages (Table 3). This picture is also evident if we look at the kernel density graph (kernel density graph gives us the probability density function of a continuous random variable.) which shows a rapid rise in proportion employed among the unpaid, regular and casual workers in the lower ages before falling steadily with rising age. In sharp contrast, the proportion employed rises gradually for formal, informal workers and own-account workers (Figure 1). Among the elderly, we found a relatively larger proportion of the employed among the employers and own-account workers compared to the other categories (Table 3). Hence, it is observed that workers move into certain categories such as informal regular, casual as



well as unpaid family workers at a relatively young age whereas for the other categories such as formal workers, informal own-account as well as employers the move is undertaken in the later ages. Hence, it may possible that workers enter the workforce at a younger age through the casual, regular and unpaid workers categories and as they accumulate on-the-job-skills, experience and social capital they move on to the possibly better employment groups within the informal economy or the formal sector.

Table 4 : Informality among Non-cultivator workers across poverty categories (percentage)						
Employment Categories	Year	Poverty Categories				
		Very Poor	Poor	Marginal	Vulnerable	Middle Class & above
Formal Workers	2004-05	7.04	12.77	13.91	31.35	34.92
	2011-12	4.13	7.6	10.52	32.2	45.56
Informal Own-account workers	2004-05	28.27	25.35	17.68	20.21	8.49
	2011-12	15.26	20.46	19.04	28.96	16.27
Informal Employers	2004-05	3.89	7.31	15.55	30.25	43
	2011-12	3.13	4	13.97	30.08	48.83
Informal Unpaid Family Workers	2004-05	30.09	26.68	18.58	18.38	6.28
	2011-12	19.86	21.65	19.44	26.15	12.89
Informal Regular Workers	2004-05	25.02	23.83	17.56	22.98	10.61
	2011-12	11.86	18.02	17.67	33.51	18.94
Informal Casual Workers	2004-05	43.33	28.83	14.71	11.18	1.96
	2011-12	26.71	27.3	19.53	20.8	5.66
Total	2004-05	27.76	24.1	16.72	20.27	11.15
	2011-12	16.17	19.77	17.64	27.95	18.46
Source : Authors' calculations based on NSSO data						
Note: Row total is add up to 100 percent						

Many authors have considered informality and poverty as synonymous, though not entirely true, but there is a significant overlap between them. Further, it is argued that developing countries faces serious challenge of employment than unemployment, signifying the seriousness of working poor in developing nations (Fields, 2011a; 2011b) Hence, looking at the poverty rates of the workers across informal categories may give us some insight into the nature and magnitude of the problem India has. It is observed across poverty groups poverty is significantly higher among the informal categories such as own-account workers, unpaid family workers as well as regular and casual workers where around half the workers are poor. Comparing over time, there has been a significant reduction in poverty across all employment categories. Declining shares of very poor, poor and marginal workers within different segments of informal employment is desirable, and this is what observed. But, surprisingly within the formal employment share of economically poor is falling, suggesting economically backward individuals are not getting job in formal employment. Interestingly, poverty is considerably lower among informal employers compared to formal workers. The above picture indicates a heterogeneous informal sector with informal employers having incomes at-par with the formal economy whereas the other components of the informal economy considerably poorer than the formal sector. This reflects the complexity of the informal and formal employment.

It may be noted that in India poverty falls more on some marginalised groups such as Schedule Tribes (ST), Schedule Caste (SC), and Muslims, though over the years incidence of poverty on them is declining. For instance, in India incidence of poverty among ST, SC, and Muslims are 43, 29.4, and 25 percentage in for 2011-12, whereas at aggregate level it was only 25 percentage and for general category (usually mentioned as others) it is even lower at 12.5 percentage (Panagariya and More, 2013). Further, in India social and religious stratification plays a decisive role in occupational distribution and labour market outcomes (Das, 2006). Therefore it is imperative to examine informality with reference social and religious communities.

Table 5 : Informality among Non-cultivator workers across Social Castes and Religions (percentages)								
Employment Categories	Year	Religions			Social Groups			
		Hindu	Islam	Others	ST	SC	OBC	Others
Formal Workers	2004-05	86	6.18	7.82	4.69	15.6	30.47	49.24
	2011-12	86.5	6.17	7.33	5.97	14.67	34.33	45.03
Informal Own-account workers	2004-05	76.79	17	6.21	3.79	16.75	42.8	36.66
	2011-12	75.67	19.07	5.27	4.1	15.98	44.34	35.58
Informal Employers	2004-05	75.05	12.53	12.43	0.49	5.26	31.05	63.21
	2011-12	71.03	18.37	10.6	1.61	4.99	36.7	56.7
Informal Unpaid Family Workers	2004-05	77.73	15.67	6.6	4.32	14.95	48.56	32.17
	2011-12	75.16	18.91	5.92	4.33	14.34	49.07	32.27
Informal Regular Workers	2004-05	81.47	11.78	6.75	3.7	18.55	38.75	38.99
	2011-12	79.26	14.48	6.25	3.83	18.15	41.66	36.36
Informal Casual Workers	2004-05	81.31	13.05	5.65	10.3	29.85	40.08	19.78
	2011-12	80.33	14.86	4.81	10.25	30.11	43.41	16.22
Total	2004-05	79.73	13.74	6.54	5.15	18.92	40.77	35.16
	2011-12	78.97	15.28	5.75	5.87	19.45	42.5	32.19
Source : Authors' calculations based on NSSO data								
Note: Row total is add up to 100 percent								

The incidence of informality across caste and religion community should also throw some light as to whether it is restricted to some social groups. However, it may noted that examining it in absolute terms without taking into account their population share may reveals distorting result<sup>1</sup>. Looking at labour informality across religions, it was found that among formal workers Hindus have a relatively higher representation and Muslims have a significantly lower representation compared to their representation among the whole workforce and total population. Further, within formal employment Hindu's share is increasing whereas their population share is declining, and for the Muslims the trend

is reversed. Within informal regular and casual workers, both Hindu and Muslims have more or less equal share as their share in total population. This suggests and is observed as well, the rationed out workers from formal employment for Muslims have joined in the self-employment categories (i.e. informal own-account, informal employers, and unpaid family workers). It is worth noting that, within self-employment categories, the sharpest rise for Muslims has happened for informal employers. As pointed out earlier (Table-4), the increase in informal employers is concentrated among the relatively affluent section of the society, it elucidates that not all Muslims rationed out from formal job are poor; in-fact many of them are not. It appears at least for majority of Muslims, rationing out of formal employment, informal employment is voluntary rather than by no-choice.

Examining informality across caste groups, it is observed that compared to their overall representation in the workforce and total population, STs and the SCs have a significantly larger representation in the casual worker category. At the same time, their representation is much lower among informal employers. Similarly, among the Other Backward Caste (OBCs) we find a relatively higher representation among unpaid workers and at the same time a relatively lower representation among formal workers and informal employers. In sharp contrast, it was found that for the ‘Others’ category workers have a relatively higher representation in the formal workers and informal employers compared to the overall workforce (Table 5). Hence, there was a division of the employment categories based on caste whereby the better employment categories are mostly held by the ‘Others’ group, whereas the other marginalised social groups are mostly employed in the other inferior employment categories. So, it is not surprising poverty falls more on these marginalised groups. Now, we have examined informality on the basis of gender and space.

Table 6: Informality among Non-cultivator workers across Sectors and Gender					
Employment Categories	Year	Sector		Gender	
		Urban	Rural	Female	Male
Formal Workers	2004-05	65.44	34.56	16.81	83.19
	2011-12	66.6	33.4	18.27	81.73

Informal Own-account workers	2004-05	38.35	61.65	24.92	75.08
	2011-12	43.42	56.58	22.88	77.12
Informal Employers	2004-05	73.63	26.37	5.3 3	94.6 7
	2011-12	70.43	29.57	5.27	94.73
Informal Unpaid Family Workers	2004-05	29.71	70.29	61.09	38.91
	2011-12	41.07	58.93	50.02	49.98
Informal Regular Workers	2004-05	61.35	38.65	21.05	78.95
	2011-12	63.28	36.72	20.41	79.59
Informal Casual Workers	2004-05	31.01	68.99	18	82
	2011-12	24.6	75.4	19.47	80.53
Total	2004-05	43.34	56.66	27.27	72.73
	2011-12	45.74	54.26	23.15	76.85
Source : Authors' calculations based on NSSO data					
Note: Row total is add up to 100 percent					

Considering the spatial composition of the various employment categories, as expected most of the formal workers as well as informal employers and regular workers are found to be concentrated in the urban areas. On the other hand, own-account workers, unpaid family workers and casual workers are mostly in rural areas. The trend for different components for self-employed is exactly opposite in rural and urban area. It is interesting and counter intuitive to note that, within self-employed – informal employers – share in urban area is falling whereas it is increasing. This is probably due to sharp rise in non-farm employment in rural area; and rural youths who have education for about only 10 years or so, are not interested to do agricultural works and at the same time with such level of education finding a formal job become difficult. Hence, they were starting their own business. It is observed that share of informal casual workers have been increasing in rural area. Keeping in mind, it is only for non-cultivator workers - this is may be due to implementation of Mahatma Gandhi National Rural

Employment Guarantee Act (MGNREGA) which provided guarantee of casual jobs to rural workers and given that wage rate higher in MGNREGA than other types of works in rural setting, many women have started working there. This also partially explains the rising trend of female informal casual employment (Table-6).

The gender compositions of the employment groups shows that compared to their representation in the workforce, males are over-represented in formal employment and informal employer categories where as women are mostly represented in the other employment categories. This is especially true for unpaid family workers (Table 6). The above trends show that the precarious employment categories are generally restricted to women and the rural areas whereas men and urban areas have a much higher representation in the better employment categories. This is not surprising, as females in general and rural females in particular have restricted access to formal education to gain skill. Next we have examined informality with respect to educational attainment.

Table 7: Informality and Educational levels among Non-cultivator workers

Employment Categories	Year	Educational Status (Mean years of school)			Technical education	
		Below 6	6 to 12	13 & Above	Have	Don't have
Formal Workers	2004-05	14.9	39.78	45.32	17.91	82.09
	2011-12	10.35	34.83	54.82	18.8	81.2
Informal Own-account workers	2004-05	56.9	33.94	9.16	3.18	96.82
	2011-12	47.71	41.16	11.13	2.61	97.39
Informal Employers	2004-05	18.3	51.7	30	13.53	86.47
	2011-12	18.43	55.25	26.33	7.36	92.64
Informal Unpaid Family Workers	2004-05	64.72	30.17	5.11	1.28	98.72
	2011-12	49.13	40.49	10.39	1.83	98.17
Informal Regular	2004-05	40.55	44.86	14.59	5.94	94.06

Workers	2011-12	33.92	48.24	17.84	5.38	94.62
Informal Casual Workers	2004-05	72.24	26.57	1.2	0.81	99.19
	2011-12	67.63	30.73	1.64	0.69	99.31
Total	2004-05	52.35	34.73	12.93	4.95	95.05
	2011-12	44.56	38.98	16.46	4.98	95.02
<i>Source</i> : Authors' calculations based on NSSO data						
<i>Note</i> : Row total is add up to 100 percent						

Formal education and vocational education indicates to potential employer the signal about workers skill. Higher educated are the first to be absorbed in the formal employment category, and lowest skilled, signalled by level of education, will be engaged in informal unpaid family works or in informal casual works. This is what we observed as well. A similar picture is evident from the technical education background of the workers. Informal employers have demonstrated quite unique feature, as its share has increase over the years for the group having educational level six to twelve years, but for technical education it had declined. This required further, investigation may be at grass root level to examine the cause of this. It is worth noting, among the non-cultivators workers (where we need more vocation trained workforce) the share of workers having any vacation training is less than five percent. This poses a serious challenge for India to improve its manufacturing sector. At the same time we see a general improvement in the educational standards of the workers across all employment groups over the period (Table 7). We have observed a division of workers on the basis of formal skills or educational levels of workers with some categories such as formal workers and informal employers faring significantly better than others.

In the development process both in terms of value added and employment, transition from agriculture to industry, and then to services is desirable, since later two sectors are perceived to be more productive. Wage rate in those sectors is higher, and hence preferred sectors for employment. Employment categories across various industries elucidate that that most of the formal employment is

concentrated in the service segment, particularly in ‘Commercial, Social and Personal Services’ and this is followed by ‘Manufacturing’ sectors. On the other hand, ‘components of self-employment and, ‘Regular Workers’ are mostly engaged in the Trade, Hotels and Transportation’ sectors, followed by manufacturing. Within the self-employed, more than 50 percent of informal employers are in Trade, Hotels and Transportation’. This may be due to growing tourism in India providing huge opportunity for semi-skilled- relative affluent individuals with some experience to start their own business in this sector. Unpaid family workers are mostly employed in the agriculture, manufacturing and ‘Trade, Hotels and Transportation’. Finally, casual workers are predominantly employed in the ‘Construction’ sector and to some extent in the manufacturing and ‘Trade, Hotels and Transportation’ sector. Although there have been some changes in the sectorial composition of employment, the overall pattern is similar over the period (Table 8) for most of the sectors, except for agriculture and construction. There is sharp increase latter and drop in the former. Though movement of workers from agriculture to construction is desirable, given the condition of casual workers in construction sector is dejected (PUDR, 2010) – this movement needs to make out with a pinch of salt.

Table 8 : Informality among Non-cultivator workers across Industrial Groups (percentages)								
Employment Categories	Year	Agriculture	Manufacturing	Mining, Electricity & Water Supply	Construction	Trade Hotels & Transportation	Finance, Insurance & Real Estate	Commercial, Social & Personal Services
Formal Workers	2004-05	0.64	19.97	5.97	1.73	12.81	8.16	50.71
	2011-12	0.63	19.21	5.25	2.96	17.56	6.21	48.18
Informal Own-	2004-05	16.45	23.61	0.24	5.01	42.76	3.05	8.88
	2011-12	10.54	24.73	0.31	5.46	44.27	2	12.68



account workers	12							
Informal Employer s	2004- 05	2.38	22.96	0.19	8.65	51.03	8.32	6.47
	2011- 12	3.79	24.29	0.1	8.56	51.89	1.69	9.69
Informal Unpaid Family Workers	2004- 05	37.6	28.3	0.17	0.96	26.29	0.83	5.87
	2011- 12	21.97	33.02	0.65	1.44	35.52	0.23	7.16
Informal Regular Workers	2004- 05	1.61	29.87	0.88	2.21	33.51	4.75	27.18
	2011- 12	0.65	29.44	2.1	3.55	32.71	2.17	29.4
Informal Casual Workers	2004- 05	5.53	22.16	3.81	48.63	13.79	0.54	5. 5 4
	2011- 12	5.03	14.64	2.47	64.59	9.22	0.09	3.97
Total	2004- 05	13.02	24.59	1.75	11.67	29.49	3.25	16.23
	2011- 12	6.89	22.97	1.93	19.31	28.77	2.01	18.14
Source : Authors' calculations based on NSSO data								
Note: Row total is add up to 100 percent								

b. *Informality and Quality of Work*

Labour informality as a concept closely relates to the quality of employment. Quality of employment is a complex and multidirectional concept, and it depends on the perspective from where it is viewed (ILO, 2013; United Nation Economic Commission for Europe (UNECE), 2010; EUROFOUND, 2013; Muñoz de Bustillo, 2009; United Nations Economic Commission for Europe, 2008). Different dimensions<sup>2</sup> proposed by ILO and UNECE for measuring quality of work are at macro level. However, the present study is based on micro information at individual level. Hence suitable modification is done.

Generally social security and size of the enterprise are used as the yard stick to distinguish between low and high quality at micro-level. Two dimensions namely: safety and ethics of employment, and workplace relationships and work motivation could not be taken due to data constraint. Indicators taken for other dimensions are: for income and benefits from employment – MPCE, and regularity of wage payment; for working hours and balancing work and non – availability of paid leave; for security of employment and social protection- social security, status of employment (part-time/fulltime, regular/irregular, permant/temporary); for social dialogue- union membership, and for skills development and training – skill level of the job, and on the job training are considered.

Based on these indicators, we conduct cluster analysis for the total non-cultivation workforce which yields three distinct classes. The silhouette coefficient which is a measure of the goodness of the cluster solution varies between 0.3 and 0.4 in both the periods, which appears to be decent. We see that cluster 1 fares considerably better than the other two clusters in all the dimensions. Comparing clusters 2 and 3, we see that cluster 2 has a better record in 7 of the 13 attributes whereas cluster 3 fares better in the other attributes. However, it is worth noting that the two clusters fare quite similar to each other compared to cluster 1. Further looking into the informality rates across clusters we find that the first cluster mostly constitutes the formal workforce whereas the other two constitute the informal workers (Table 9). Hence, the three clusters can be grouped as formal (cluster -1) and informal (cluster 2 and 3). On further investigation of the clusters across various usual activity status

it is found that in cluster 1 more than 98 percent workers are regular workers, hence this cluster can be named as formal regular. In cluster 2 more than 50 percent are in casual works, and more than 35 percent are in regular works. In cluster -3 more than 95 percent are in self-employed categories. Therefore, cluster 2 can be named as informal wage workers, and cluster 3 is informal self-employed. Hence, it can be inferred that workers in cluster-1 have better quality job followed by cluster -2, and cluster 3 housed low quality of works.

Table 9: Informality rates across clusters for Non-cultivator workers			
Clusters	Year	Formal	Informal
Cluster 1	2004-05	92.2	7.8
	2011-12	75.91	24.09
Cluster 2	2004-05	2.32	97.68
	2011-12	2.32	97.68
Cluster 3	2004-05	0	100
	2011-12	0.07	99.93
Source : Authors' calculations based on NSSO data			
Note: Row total is add up to 100 percent			

As expected incidence of poverty in formal employees are the lowest. However, informal self-employed have better incidence of poverty than the informal wage employees, where majority are in regular wage workers. This suggests all of self-employed is not involuntary; at least some part is voluntary as it was observed earlier.

Table 10: Gender, Sectorial and Educational distribution of the clusters								
Clusters	Year	Gender		Sector		Education Status (Mean Years of school)		
		Female	Male	Urban	Rural	Below 6	6 to 12	Above 12
Formal Workers	2004-05	17.81	82.19	65.04	34.96	13.06	40.13	46.81
	2011-12	19.5	80.5	66.51	33.49	10.2	36.86	52.94
Informal Regular Wage Employee	2004-05	18.68	81.32	46.02	53.98	57.8	35.33	6.87
	2011-12	19.08	80.92	38.91	61.09	57.38	37.32	5.3
Informal Self-Employed	2004-05	35.13	64.87	36.14	63.86	58.84	32.97	8.19
	2011-12	28.53	71.47	43.27	56.73	47.25	41.42	11.33
Total	2004-05	27.27	72.73	43.34	56.66	52.35	34.73	12.93
	2011-12	23.16	76.84	45.75	54.25	44.56	38.97	16.46
Source : Authors' calculations based on NSSO data								
Note: Row total is add up to 100 percent								

The spatial composition of the three clusters reveals that cluster 1 is mostly concentrated in urban areas; the other two categories are distinctly rural. However, cluster-2 and 3 were moving in opposite direction over the year. Cluster-2 rural share is increasing and this may be attributed towards rising public work provision through Mahatma Gandhi National Rural Employment Gurantee Act (MGNREA) since 2005. Declining trend of cluster-3 in rural area may due to unpaid male family workers getting job in public works where the wage rate in higher than the rural floor wage rate. This leads to increase in household income. This is in turn reducing work participation of female, particularly home-based female workers. This is also reflected by sharp decline in female workers share in cluster-3. As expected, in all three clusters, male participation is significantly more than female (Table 10).

However, informal self-employed category, in contrast, has a relatively much higher representation of females but it has witnessed a sharp decline. The decline is due to both reduce in LFP and WFP rate among women in rural area. This may be due to three reasons (1) income effect (as income of household increases reservation wage of female increases), (2) rising girl enrolment particularly in middle and secondary schools (this has in-fact two fold effect- one is direct- earlier proportion of girls not in school were joining the labour force and usually were working in home-based works but now they are in school so reducing female LFP; second is indirect – earlier some part of girls who were neither in schools nor in labour force were taking care of household chores and younger children in the family so making elder female members free to work, but as they are now in school elder female members are forced to look after the family and do household chores hence forced to withdraw from workforce), (3) given the socio-religious norms in India males are the primary bread earner and job opportunity for female is limited.

The educational status of the different clusters indicates that formal employees have a much higher educational level compared to the other two informal categories. It is interesting to note that there is a significant rise in cluster 3 among workers having middle level of education (six to twelve years of schooling), and a marginal increase for higher educated workers (Table 10). This may be due to two factors (1) rising unemployment among educated youth and (2) voluntary choice of joining informal self-employment. Both the factors are opposite to each other suggesting the co-existence of complex informal self-employment.

Table 11: Age distribution of clusters

Clusters	Year	Less than 16	16-25	26-35	36-45	46-60	Above 60
Formal Workers	2004-05	0.03	6.88	27.6	33.7	31.29	0.5
	2011-12	0.15	12.97	31.49	28.41	26.16	0.82

Informal Regular Wage Employee	2004- 05	3.2	34.5 2	30.7 3	19.3 5	10.4 1	1.7 9
	2011- 12	1.77	27.5	31.21	22.74	14.11	2.67
Informal Self- Employed	2004- 05	3.83	22.28	28.45	23.48	17.12	4.84
	2011- 12	1.52	16.62	28.3	26.83	20.96	5.77
Total	2004- 05	3.11	24.33	29.1	23.46	16.76	3.23
	2011- 12	1.37	20.27	30.03	25.5	19.19	3.65
Source : Authors' calculations based on NSSO data							
Note: Row total is add up to 100 percent							

Formal employees are concentrated in the 25 to 60 year age group. Given cluster-1 is better quality of job, as individual age increases they should moved towards it, but within formal workers share of employees in age group of 36-to 60 has declined by almost ten percentage points is puzzling. Nevertheless, this may be partially explained by voluntary part of self-employed workers rise. In cluster-2 employees are concentrated in the 15 to 45 age group. Informal self-employed in cluster-3, however, revealed very complex pattern and trend. In 2004-5 it was mostly concentrated among workers in age group 16-45, but it shifted to 26-45. Further within cluster-3, workers in age cohort of 16-25 are falling and for 36-60 is rising (Table 11). Next, quality of work and industrial distribution was examined.

Most of the cluster-1 workers in service sector followed by manufacturing as expected. Within service sector, more than half of the formal workers are engaged in Commercial, Social & Personal Services followed by Trade, Hotels & Transportation sectors. On the other hand, a bulk of the informal wage employees is engaged in manufacturing, Construction and Trade, Hotels & Transportation sectors. Finally, Informal Self-Employed are primarily engaged in Trade, Hotels & Transportation, manufacturing and agriculture sectors (Table 12). The above analysis shows the different attributes and characteristics of the formal employees as well as the two distinct components within the informal employment. It suggests there is high degree of heterogeneity across employment categories, and rising complexity within informal employments. The next section by applying Multinomial Logit explores the individual, household, and industrial characteristics that explain participation in different segments of informality.

Table 12: Industrial classification of clusters

Clusters	Year	Agriculture	Manufacturing	Construction	Trade, Hotels & Transportation	Finance, Insurance & Real Estate	Commercial, Social & Personal Services	Mining, Electricity & Water Supply
Formal Workers	2004- 05	0.5	17.46	1.11	12.84	8.3	53.94	5.85
	2011- 12	0.55	18.83	1.91	19.28	5.87	48.95	4.61
Informal Regular Wage Employee	2004- 05	3.35	26.55	28.01	23.14	2.52	13.93	2.5
	2011- 12	3.21	21.1	42.91	18.52	0.74	11.18	2.34

Informal Self- Employed	2004- 05	22.35	25.14	3.97	37.74	2.43	8.13	0.23
	2011- 12	13.05	26.5	4.64	42.41	1.54	11.47	0.39
Total	2004- 05	13.02	24.59	11.67	29.49	3.25	16.23	1.75
	2011- 12	6.89	22.97	19.3	28.77	2.01	18.13	1.93
Source : Authors' calculations based on NSSO data								
Note: Row total is add up to 100 percent								

*c. Micro-determinants of Informality*

It observed from previous discussion informal employment is heterogeneous and complex in India. So the natural question arises, who participate in different components of informal employment compared to formal employment? The bi-variate analysis of different categories of employment with a number of individual, household and industry classification presented in the previous two subsections is enlightening but those characteristics cannot be interpreted as determinates of participation of informal employment. For instance, workers from poor households may be largely in different type of informal employment, but this may be due to these individuals have lack of education and may be belonging from particular social class resulting them to get informally employed.

Determinants of incidence of informality or self-employment has been examined by many researchers for African, European, Latin America, North America, Caribbean and other developing countries, however studies on South Asia is limited. For instance Hazans (2011) and Williams and Windebank (2015) for European countries, Gindling and Newhouse (2014) for 74 developing countries, Bacchetta and Bustamant (2009) for developing countries, Bosch et al (2007) for Brazil, Feld and Schneider (2010) for OECD Countries, Loayza et al(2009) for Latin America and the Caribbean, , Chen and



Doane (2008) for South Asia, and Dougherty and Escobar (2013) and Bosch and Maloney (2006) for Mexico etc. However, there are limited numbers of studies that have examined determinants of participation in informal employment at micro-level i.e. at individual level. Lehmann (2015), and Lehmann and Zaiceva (2013) for Russian labour market, Bracha and Burke (2014) for United States, Radchenko (2014) for Egypt, Gasparini and Tornarolli (2007) for Latin America and the Caribbean, and Angel et al (2012) for Middle East and North Africa, and Dimova et al (2010) have examined informality at micro-level .

Most of the above studies have dichotomised employment, hence did not examine the heterogeneity within informality. In the present study, multinomial logistic model is applied in order to investigate the determinants of the different categories of informal employment. We differ from many of the studies as most of them have taken formal and informal as two categories but we have classified informal employment to further five segments since there was a significant heterogeneity observed as discussed earlier. The methodology and other explanatory variables are discussed in data source and methodology section. Sub-national region dummy (state level dummy) also added to the independent variables to control for unobserved governance and other institutional effects. For this Uttara Pradesh is taken as the base state as it is the largest state in India and housed largest chunk of informal employment. The odd ratios of the result are reported in Appendix – 4, Table 13. The base outcome for reference is formally employment. The models are significant overall with a Wald Chi-square which is significant at 1 per cent level of significance. The Pseudo  $R^2$  in both the periods is above 32 percent which is decent.

Table 13 elucidated that, controlling for other factors, , both in 2004-5 and 2011, with additional years of education odds of working informally decreases for all categories of the informally employed, particularly it has reduced by 21 percent in case of informal casual workers. This suggests that as an individual gain education they are less likely to be employed in informal casual work. This is consistent with the earlier studies (Dimova et al (2010); Angel et al (2012), Lehmann and Zaiceva (2013) Radchenko (2014). Similarly, compared to formal employment, having no technical education significantly raises the odds of all the categories of informal employment except informal employers

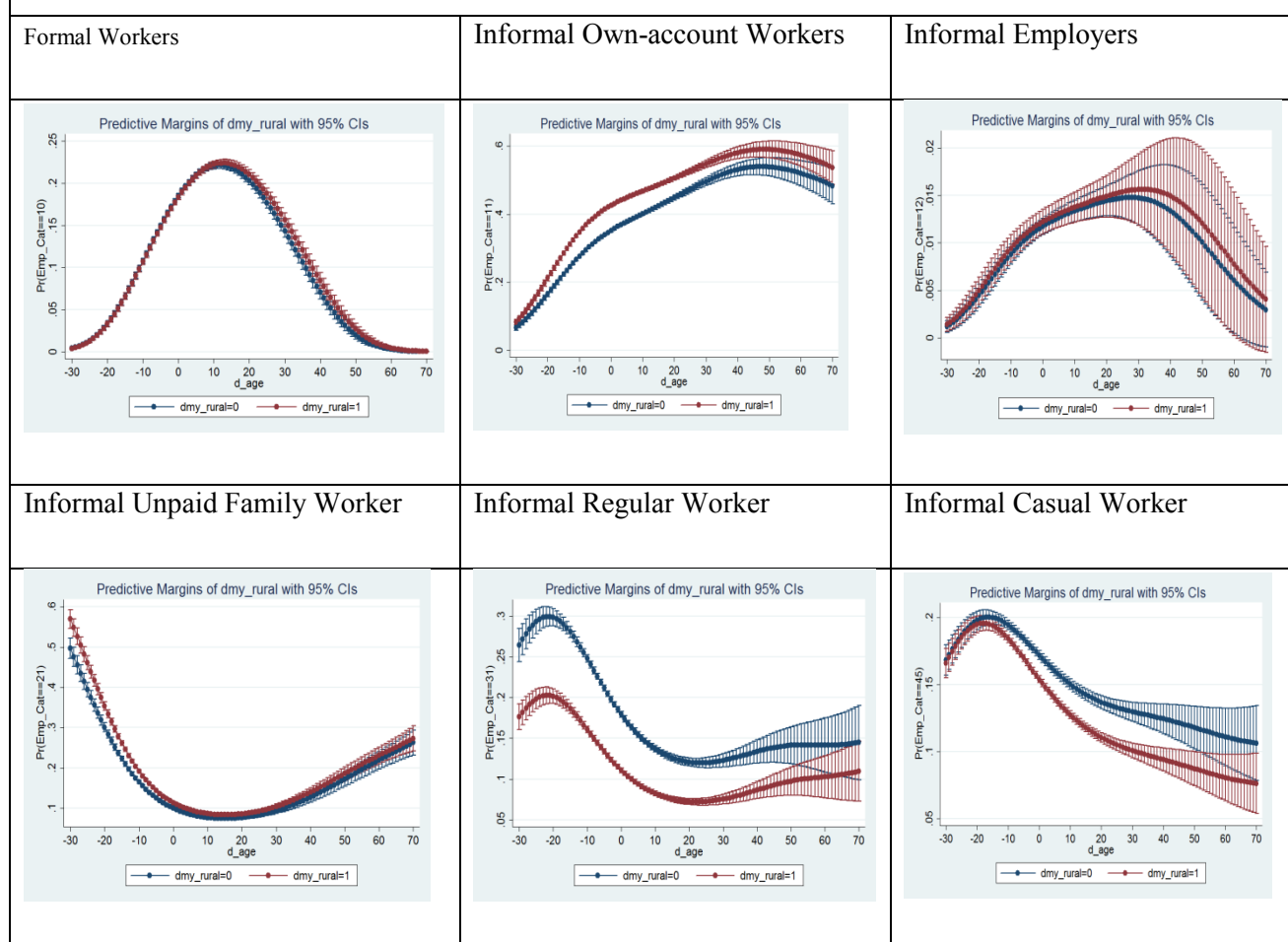
where the relationship is insignificant (Table 13). For example, it is found that workers having technical education are more than two times likely to get formal employment than in unpaid family worker similar to finding of Dimova et al 2010 for West Africa. The effects of education on informality (both technical and general) support the dual market hypothesis.

Age, which is considered to be a proxy for experience, is found to be exercising negative impact on the odds of different components of informality compared to the base outcome of formally employed, except for the informal employer. Compared to the formally employed every additional year of age lowers the odds of the different categories of the informal employment by around 5 per cent only in both the periods. Comparable observation was made in previous literature for different developing countries (Dimova et al (2010); Angel et al (2012), Lehmann and Zaiceva (2013), Radchenko (2014). However, this relation is not statistically significant for the informal employers so that we may conclude that there is no significant difference between the formally employed and informal employers with respect to age (Table 13). But it may be noted that the odd ratio is greater than one suggesting preference of informal employer than formal job consistent with our bi-variate analysis earlier and coherent with the finding of Lehmann and Zaiceva (2013) for the study of Russian labour market while measuring informal employment by firm size. The interaction of rural area and age suggests that as age increases there is only one to two percent more likely for rural workers to be in informal works than formal works compared to identical urban workers.

Post-estimation results of the relation of informality with age using STATA's 'margins' command reveals a varied response of the probability of different categories of informality to age. In the case of casual, regular workers probability of informality shows a declining trend with increase in age. However, we see a rising trend of informality with respect to age for own-account workers as well as employers. Informal unpaid family workers depict a U-shaped pattern with the probability of informality falling steeply at lower ages before rising slowly again at around the age of 50. Finally, we get an inverted U-shaped graph of the probability of formal employment against age. This pattern can be considered as a summation of the varied patterns of informality against age for the different components of informal workers (Figure 2). The observed patterns depict the different responses of

informality towards age. We find that workers move out of certain jobs such as informal casual and regular work towards supposedly more favourable ones like formal jobs, informal employers and own-account workers.

Figure 2 : Probability Of Employment In Various Formal And Informal Categories Against Age ( 2011-12)



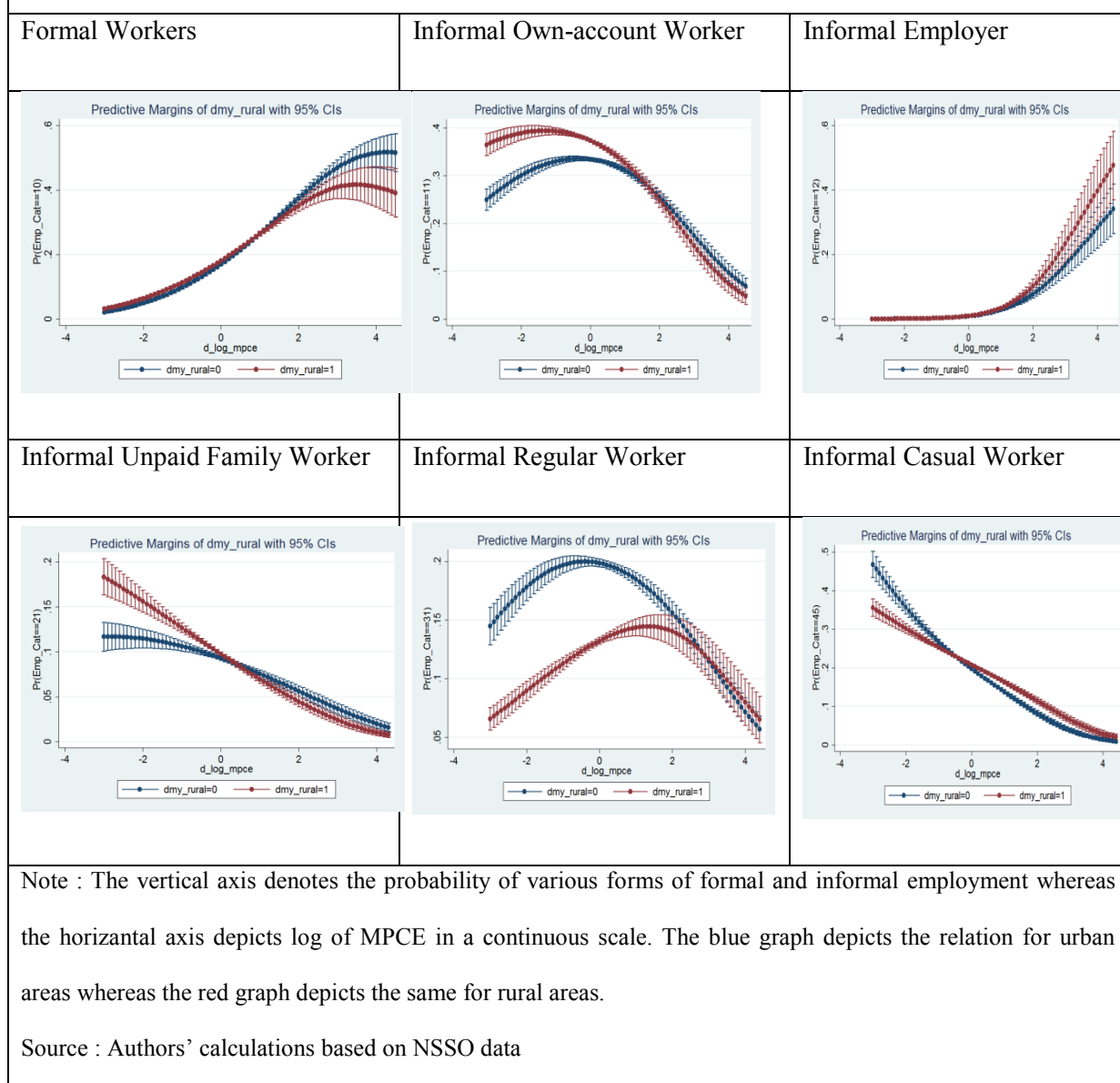
Note : The vertical axis denotes the probability of various forms of formal and informal employment whereas the horizontal axis depicts age in a continuous scale. The blue graph depicts the relation for urban areas whereas the red graph depicts the same for rural areas.

Source : Authors' calculations based on NSSO data

We also find wide variations regarding the impact of MPCE on the odds of different categories of informal employed in both the periods. In the case of unpaid family workers as well casual workers every percentage increase in MPCE lowers the odds of that choice significantly by about 0.60 to 0.80 per cent. For, informal regular workers and own-account workers that effect is moderated to about 0.50 to 0.60 per cent. From the results we can reason that the choice of employment categories like own-account workers, unpaid family workers as well as informal regular and casual workers is of an involuntary or exclusionary nature. This suggests these informal jobs are last resort for individuals, and as their consumption (indication of rise in income and standard of living) increases they prefer to work in a formal job. On the other hand, in the case of informal employers every per cent increase in MPCE increases the odds of that choice by about 51 per cent in 2004-5 and has increased to 102 percent by 2011-12 compared to formal employment (Table 13). The rising per-capita income and rapid economic success has offered a large market and many entrepreneurs have preferred to start their new business than be a formal employee. The odd ratio in from 2004-05 to 2011-12 is increasing; this suggests the rising preference for informal employer to formal jobs over the year. We can infer that the poverty status of informal employers is significantly better than formal employees indicating that the choice of informal employers as an employment category is of a voluntary nature rather than of an exclusionary nature.

Post-estimation using STATA's margins command reveals a downward sloping pattern of the probability of informality against MPCE for casual and unpaid workers. In sharp contrast, the pattern of informality against MPCE is distinctly upward sloping. Finally, we see an inverted U-shaped pattern of informality against MPCE for own-account workers as well as regular workers with the probability of informality rising with increasing MPCE at lower MPCE levels before falling again at higher MPCE levels (Figure 3). From these observed patterns we conclude that probability of working informally falls monotonically casual and unpaid workers as incomes rises. It is the opposite in case of formal workers as well as informal employers. The U-shaped pattern for own-account and informal regular workers show that the probability is low at low and high MPCE levels and is significantly in the mid-ranges.

Figure 3 : Probability of employment in various formal and informal categories against log of MPCE ( 2011-12)



Socio-cultural and religious factors have been major factors for household decisions on economic activities. Looking at the odds of different categories of informality by religions communities, we observed that with reference to the majority Hindus, being from minority religious communities like Islam and other religions significantly raises the odds of all the categories of informal employment. In otherwords, workers from Islamic and other religious communities are more likely to be in informal employment than Hindus. Further, we find that with reference to Hindus informal employment have

shifted towards the Muslims and away from the 'Others' religions communities. However, contrary to the expectation, *ceteris-paribus*, among the social strata marginal social groups like SC, and ST are more likely to be in formal employment than general caste (Others caste) with reference to any of the informal employment categories. But in case of OBC the likelihood of in the informal own-account worker and informal casual worker is more than the general caste (Table 13).

Looking at the effect of gender for 2011-12, we found that with reference to the base outcome of formal employment, being male raises the odds of being informal employers significantly by about 791 per cent. In simple terms, males are most likely to be opening their own business than females. However it may be noted that the odd ratio in 2004-5 was not statistically significant in favour of males compared to female in informal employment category. This indicated with rising per-capita income in recent years in India has provided new business opportunity being capitalized by males only. Similarly in informal casual workers males are more likely to participate than female. Being female on the other hand significantly raises the odds of other types of informal employment with the highest effect observed in the case of unpaid family workers, where being female raises the odds of that choice by around 77 per cent in 2004-5 to 67 percent in 2011-12. This indicates that over the years there is 10 percent decline in females to be in family unpaid work.

Both in informal own-account employment and informal regular employment choices, the odd ratio was statistically significant in 2004-5 and also less than one, suggesting thereby females were more likely to be in these two categories of employment. However, in 2011-12 the odd ratio has increased and become closer to one, and it is not statically significant, this may be indicating there are no difference in likelihood of participation of males and females in these two employment categories. This is different to earlier findings where most of them found informality either falls more on women (Dimova et al (2010); Angel et al (2012), Radchenko (2014) or on men Lehmann and Zaiceva (2013) (Table 13). Further it was observed for 2011-12 that being female and married increases the odd of being employed in informal own-account work by 36 percent, family unpaid worker by 211 percent and informal casual work by 98 percent. However, with reference to informal employer and regular work there is no apparent conclusion. Being poor and female increases the odds being in informal

casual work and regular work in 2011-12. It is worth noting that, in 2004-5 poor females were less likely to be in unpaid family, but by 2011-12 the trend may have changed, as the odd ratio is marginally less than one and statistically significant. The interaction between age and gender reveals that there is hardly any difference (only about one to two percent) in likelihood of informal employment between older males and females.

Regarding the rural-urban composition of informality we found that for 2004-05, the odds of informal own-account workers, employers, unpaid family worker and casual workers is greater than one and significantly higher in rural areas, suggesting workers in rural area more likely to participate in these informal works than formal works compared to their urban counter parts. Whereas for informal regular workers the odd ratio it is significantly higher in urban areas, indicating workers in urban area are more likely to be informal regular work than formal employed while comparing with rural area, keeping other things constant. In 2011-12, the odds for informal categories of regular, and family unpaid worker are less than one, hence we may conclude that with reference to the base outcome the concentration of these two type of informal jobs have shifted from rural to urban areas to some extent over the period 2004-05 to 2011-12 (Table 13).

Looking at the industrial composition of the different informal employment categories, we find that compared to the Trade, transport and communications sector the odds of informality are significantly higher in agricultural sector for all employment categories except for regular salaried. Hence, we conclude that there is a significantly high concentration of unpaid family workers, own-account workers and casual workers in the agricultural sector. Further, we find that these odds are higher in 2011 compared to 2004 except for unpaid family workers. Hence informality in agriculture is seen to have risen over the period for all components except unpaid family workers. In the construction sector, we find that compared to the reference category the odds of being an informal casual worker are significantly higher and those of regular and unpaid workers are lower. Further, the odds are falling for regular and unpaid workers but have risen significantly for casual workers. Hence, we see a very high and rapidly rising casualization of workers in the construction. For the mining, electricity and water supply; manufacturing sector as well as the Commercial, Social & Personal Services sectors

we find that informality is significantly lower than the reference sector and seems to have risen over the period. For the Finance, insurance and real estate sector odds of informality are lower than the reference sector and are falling slightly over the period. Further, the sub-national state dummies have publicized very complex picture of informality across Indian states (Table -13).

#### **4. CONCLUSION**

Labour informality is a challenging issue facing the world economy today. There is a large and growing literature on this issue which highlight its significance to the current development debate. The literature also point out to the significant diversity within the informal economy. We study the issue of heterogeneity within informality from two approaches. Firstly, we conduct cluster analysis on the workers using a large number of variables reflecting their quality of work. This analysis reveals considerable differences between formal and informal workers as well as between the self-employed and the wage employed within the informal economy whether one looks at the quality of work indicators or other aspects such as age, gender, poverty etc. Secondly, we divide the informal economy into five broad categories based on the status codes of the workers. Multinomial logistic analysis conducted on the data reveals that there is considerable diversity among the informal categories with respect to age, poverty status, educational attainment, gender and industrial affiliation. There is high degree of complexity involve with respect to formal and informal employment. Therefore, single instrument policy for all workers may not lead us anywhere. There is a need for specific policy measures for different categories of employment to address the diverse natures of informality in the country.

Policy measures that can be taken to tackle informality include a macroeconomic environment that supports generation of quality employment generation rather than focussing only on growth per se and legislation of specific policies to improve working conditions of the poor, particularly specific policy should be deign for construction sector workers. One such programme can be providing vocational training and certification to them. Necessary caution should be taken while formulating policy so that they should not be mutually exclusive but complementary. Studies have found that the adverse effects



of globalisation on employment and working conditions are moderated to a large extent if the country has proper safety nets in place in the form of minimum wage legislations and other labour standards (Bacchetta & Bustamante, 2009). However, the policy instruments that needs to be developed for tackling problems in the informal economy given the heterogeneous nature of the sector needs to be specific to the nature of informality. Our analysis reveals that the attributes of the different categories of informal employment are quite different from each other. In case of own-account workers as well as employers appropriate efforts need to be made to improve the productivity of the workers. For informal employers, give the voluntary nature of their informality, this need to be supplemented through dismantling of red-tapeism and other bureaucratic regulations that lowers the incentives to operate informality. However, such a policy move would not be very effective for informal casual and regular workers as well as some specific groups such as home-based workers as any productivity improvement in their case would be squeezed by intermediaries and global firms through lower prices of the informal products. Hence, in their case appropriate steps need to be to improve labour standards in an integrated way through global cooperation (Heintz & Pollin, 2003). The case of unpaid family workers is a bit uncertain as a large section of such workers comprises of young person's below 25 so that their work may be in the nature of on the job training. The category also consists of older workers and a large section of women. Appropriate measures needs to be taken to improve their productivity through formal education and training and integrating them to the mainstream labour market through NGOs, self-help groups.

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<sup>1</sup> Of the total population of India in 2001, 80.5 per cent were Hindus while Muslims account for 13.4 percent and other religious communities 6.1 percent. In 2011, the figures were: 79.8 percent, 14.2 percent, and 6 percent respectively. With respect SC and ST, in 2001 their share was 16.2 and 8.2 percentages respectively; and in 2011 share increased to 16.6 percent and 8.6 percent. 2001 population share data were considered as the reference point for 2004-5; and 2011 census data were for 2011-12.

<sup>2</sup> Different dimensions are 1) Safety and ethics of employment; 2) Income and benefits from employment 3) Working hours and balancing work and non; 4) Security of employment and social Protection; 5) Social dialogue; 6) Skills development and training; 7) Workplace relationships and work motivation

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## **Appendix 1**

The division of workers into the organised and unorganised sectors is defined as follows-

Enterprise type	Number of workers in the enterprise					
	Missing	less than 6	6 & above but less than 10	10 & above but less than 20	20 & above	Not Know
Missing	****					***
Proprietary male						
Proprietary female						



<i>Partnership with members of same household</i>						
<i>Partnership with members of different household</i>						
<i>Public Sector</i>						
<i>Public/Private limited company</i>						
<i>Co-operative societies/trusts</i>						
<i>Employer's household</i>						****
<i>Others</i>						****

Source: NCEUS (2008)

1. Cells shaded dark belongs to the unorganised sector.
2. Cells shaded light belongs to the organised sector.
3. Cells marked with \*\*\*\* belongs to the informal sector for all usual status except regular and casual workers in government works. Casual workers in public works belong to the organised sector. Similarly, Regular workers belong to the informal sectors if they have social security benefits or information on the variable is missing.

The division of workers into the formal and informal employment is done on the basis of presence of social security benefits and informal sector status as follows-

1. Own-account workers and unpaid family workers as categorised into informal employment.
2. Casual workers in public works and other works as well as Regular workers are categorised into the formal or informal employment based on the presence or absence of social security benefits.
3. Employers are categorised into formal or informal employment based on whether they belong to the organised or unorganised sector.

## **Appendix 2**

The general educational level of a worker is coded as follows in the NSSO data- *not literate -01, literate without formal schooling: EGS/ NFEC/ AEC -02, TLC -03, others -04; literate: below primary -05, primary -06, middle -07, secondary -08, higher secondary -10, diploma/certificate course -11, graduate -12, postgraduate and above -13*

The above education levels refer to the highest level *successfully completed*. For example, if a person has failed in his graduate examination, then his level will be treated only as ‘higher secondary’. This is the method followed by National Sample Survey (NSS). We derive the mean level of education for a worker as follows-

All persons for who code for education level are from 01 will be allotted 0 years of schooling. All persons for who code for education level are from 02 to 04 will be allotted 1 year of schooling. All persons for whom code for education level is 05 will be allotted 2 years of schooling. Below primary means up to Std. 4 (max), so we assume that persons falling under this category will have on an average 2 years of schooling. All persons for whom code for education level is 06 will be allotted 5 years of schooling. All persons for whom code for education level is 07 will be allotted 8 years of schooling. All persons for whom code for education level is 08 will be allotted 10 years of schooling. All persons for whom code for education level is 10 will be allotted 12 years of schooling. All persons for whom code for education level is 11 will be allotted 14 years of schooling. Diploma courses are usually for 2 years after completion of Std. 12, so we assume that persons falling under this category will have 14 years of schooling. All persons for whom code for education level is 12 will be allotted 15 years of schooling. Graduate courses are usually for 3 years after completion of Std. 12, so we assume that persons falling under this category will have 15 years of schooling. All persons for whom code for education level is 14 will be allotted 17 years of schooling. Postgraduate courses are usually for 2 years after completion of graduate programme, so we assume that persons falling under this category will have 17 years of schooling.

### **APPENDIX 3**

Poverty lines are based on the Rangarajan Committee methodology (Rangarajan et al 2014) for the year 2011-12. For 2004-05 poverty lines at state levels for rural and urban area of 2011-12 poverty areas are deflated by using Consumer Price Index for agricultural Workers and Consumer Price Index for Industrial Workers respectively. Using these poverty lines at state level for rural and urban area, and following the methodology proposed by Sengupta, Kannan & Raveendran (2008) households are classified in to five mutually exclusive groups of Poverty Category: (1) Very Poor If  $MPCE \leq 0.75$  times poverty line (PL); (2) Poor If  $0.75 < MPCE \leq 1$  PL; (3) Marginal If  $1 PL < MPCE \leq 1.25$  PL; (4) Vulnerable If  $1.25 PL < MPCE \leq 2$  PL; and (5) Middle Class and above If  $MPCE > 2$  PL.

It is worth noting that our poverty rates do not coincide with the Rangarajan Committee Report as our poverty rates are based on the consumer expenditure information from the EUS rather than consumer expenditure Survey data of NSSO as is the norm. Since consumer expenditure derived from the latter is always greater than that obtained from the former, our poverty rates are likely to be larger than the Rangarajan Committee poverty rates. Further, in our analysis, we have not taken cultivators. Hence our incidence of poverty is not comparable with Rangaranjan et al 2014.



## Appendix -4

Table 13: Odd Ratio of Multinomial Logit Regression for Determinants of Participation in Different Categories of Informal Employment

Independent Variables	Informal Own-account Worker		Informal Employer		Informal Unpaid Family Labour		Informal Regular Worker		Informal Casual Worker	
	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
<b>Individual and Household Level Covariates</b>										
<b>Years of school</b>	0.88***	0.86***	0.92***	0.93***	0.90***	0.90***	0.89***	0.86***	0.79***	0.78***
<b>Age</b>	0.96***	0.98***	1.01	1.03	0.93***	0.95***	0.95***	0.96***	0.94***	0.95***
<b>Age<sup>2</sup></b>	1.00***	1.00***	1.00***	1.00***	1.00***	1.00***	1.00***	1.00***	1.00***	1.00***
<b>Log of MPCE</b>	0.44***	0.54***	1.51**	2.02***	0.39***	0.40***	0.43***	0.56***	0.20***	0.22***
<b>Dummy Islam</b> (Base: Hindu)	1.78***	1.93***	1.79***	2.39***	1.49***	1.44***	1.11	1.34***	1.21**	1.31***
<b>Dummy Other religious community</b> (Base: Hindu)	1.22***	1.19**	1.27*	1.51***	1.34***	1.42***	1.24***	1.27***	1.30***	1.41***
<b>Dummy ST</b> (Base: General)	0.44***	0.47***	0.12***	0.34***	0.33***	0.38***	0.54***	0.49***	0.89	0.80**

<b>Dummy SC</b> (Base: General)	0.56***	0.66***	0.31***	0.28***	0.42***	0.48***	0.60***	0.74***	0.97	1.06
<b>Dummy OBC</b> (Base: General)	1.08	1.13**	0.70***	0.76	1.10*	1.10	0.92*	0.98	1.19***	1.31***
<b>Dummy of Technical Education =1, else = 0</b>	1.12*	1.71***	1.27	2.61***	2.25***	2.82***	1.28***	1.68***	1.92***	2.54***
<b>Dummy Rural =1 , Urban = 0</b>	1.51***	1.17***	1.26**	0.86	1.32***	0.87**	0.85***	0.71***	1.39***	1.40***
<b>Dummy Marital Status</b> Married/divorcee/widow/ widower =1, Unmarried =0	1.02	1.44***	1.41**	2.57***	0.40***	0.61***	0.69***	0.87	0.64***	0.91
<b>Dummy Gender :</b> Female =1, Male = 0	0.50***	0.93	1.29	8.91**	0.23***	0.33***	0.68***	0.83	1.07	2.05***
<b>Dummy Gender* Log of MPCE</b>	0.96	0.90	1.29	0.68	1.37***	0.98	0.90	0.79***	0.76**	0.74***
<b>Dummy Gender * Age</b>	1.00	1.02***	0.98	0.97	0.96***	0.96***	0.96***	0.98***	0.97***	0.99*
<b>Dummy Rural * Log of MPCE</b>	0.65***	0.85**	0.63***	0.96	0.55***	0.82*	0.88*	1.03	0.95	1.45***
<b>Dummy Rural * Age</b>	1.00	0.98***	1.00	0.99	0.99	0.98***	1.00	0.98***	0.99	0.99***

<b>Dependency Ratio</b>	1.28*	1.14	2.82***	1.81*	0.84	0.49***	0.59***	0.72**	0.81	0.53***
<b>Dummy of Female *</b>	0.97	1.36*	0.53	1.78	3.74***	3.11***	1.02	0.87	1.44**	1.98***
<b>Dummy Married</b>										
<b>Industrial Classification (Base: Trade Hotels &amp; Transportation)</b>										
<b>Dummy Agriculture</b>	2.26***	2.46***	1.10	2.20**	3.59***	3.36***	0.44***	0.30***	1.91***	4.53***
<b>Dummy Manufacturing</b>	0.24***	0.33***	0.32***	0.47***	0.28***	0.36***	0.41***	0.55***	0.67***	0.84**
<b>Dummy Construction</b>	0.68***	0.50***	1.40*	1.26	0.22***	0.15***	0.45***	0.53***	20.88***	25.44***
<b>Dummy Finance, Insurance &amp; Real Estate</b>	0.31***	0.32***	0.23***	0.10***	0.14***	0.04***	0.49***	0.38***	0.31***	0.14***
<b>Dummy Commercial, Social &amp; Personal Services</b>	0.05***	0.12***	0.05***	0.10***	0.04***	0.06***	0.27***	0.44***	0.13***	0.22***
<b>Dummy Mining, Electricity &amp; Water Supply</b>	0.01***	0.02***	0.01***	0.01***	0.01***	0.04***	0.07***	0.17***	0.49***	0.56***
<b>Sub-national regional state dummies (Base: Uttar Pradesh)</b>										
<b>Jammu &amp; Kashmir</b>	0.35***	0.34***	0.12***	0.14***	0.48***	0.41***	0.41***	0.49***	0.41***	0.33***
<b>Himachal Pradesh</b>	0.36***	0.38***	0.63	0.11***	0.21***	0.19***	0.54***	0.89	1.00	0.36***

<b>Punjab &amp; Chandigarh</b>	0.89	0.85	2.58**	2.54***	0.49***	0.57***	1.43***	1.49***	1.14	0.54***
<b>Uttaranchal</b>	0.73**	0.75*	0.52	0.65	0.33***	0.38***	0.66***	0.81	0.44***	0.35***
<b>Haryana</b>	0.77**	0.59***	0.00***	1.83*	0.48***	0.34***	1.07	0.82	0.85	0.48***
<b>Delhi</b>	0.56***	0.36***	4.97***	1.90**	0.29***	0.19***	1.64***	0.81	0.50***	0.18***
<b>Rajasthan</b>	1.21*	0.95	1.38	1.57	0.74**	0.71**	1.22	1.28**	1.19	0.89
<b>Bihar</b>	1.62***	1.09	0.03***	0.64	1.40**	1.22	0.79	0.52***	1.45*	0.84
<b>Tripura</b>	0.98	0.77*	0.52	0.15***	0.34***	0.27***	0.47***	0.57***	4.66***	1.13
<b>Assam</b>	0.61***	0.66***	0.03***	0.30***	0.30***	0.37***	0.29***	0.29***	1.70***	0.81
<b>West Bengal</b>	1.22**	0.95	1.16	3.03***	0.43***	0.36***	0.82*	0.73***	2.21***	1.07
<b>Jharkhand</b>	0.73**	0.60***	0.01***	1.13	0.43***	0.52***	0.61***	0.47***	1.68***	0.96
<b>Orissa</b>	0.67***	0.66***	1.24	0.86	0.63***	0.65***	0.52***	0.53***	0.73**	0.40***
<b>Chhattisgarh</b>	0.43***	0.71**	0.33**	3.57***	0.35***	0.66**	0.79	1.52***	0.99	1.28
<b>Madhya Pradesh</b>	0.87	0.67***	0.28	0.27***	0.81*	0.57***	1.19	0.66***	1.24*	0.56***
<b>Gujarat</b>	0.54***	0.63***	1.09	1.18	0.48***	0.41***	0.98	1.37**	2.36***	0.75*
<b>Maharashtra, Dadra &amp; Daman</b>	0.50***	0.45***	3.90***	1.27	0.29***	0.31***	0.98	1.02	1.31**	0.52***
<b>Andhra Pradesh</b>	0.74***	0.57***	2.56**	1.44	0.50***	0.43***	0.96	1.03	1.38***	0.75**



Karnataka	0.53***	0.35***	1.52	1.87	0.28***	0.22***	0.61***	0.59***	1.41***	0.65***
Goa	0.15***	0.21***	0.59	0.04***	0.04***	0.05***	0.35***	0.30***	0.88	0.27***
Lakshadweep & A&N Islands	0.17***	0.20***	1.32	0.22***	0.07***	0.09***	0.11***	0.87	1.53*	0.65
Kerala	0.66***	0.63***	7.18***	5.92***	0.17***	0.21***	1.10	1.42***	7.35***	4.84***
Tamil Nadu & Pondicherry	0.47***	0.39***	3.72***	1.54	0.24***	0.21***	0.97	0.98	1.47***	1.45***
NE excl. Assam & Tripura	0.75***	0.54***	1.19	0.92	0.36***	0.33***	0.55***	0.33***	0.77*	0.37***
Constant	22.41***	5.13***	0.06***	0.00***	9.72***	3.31***	7.96***	3.31***	0.48***	0.16***
Year			2004-05			2011-12				
No. of observations:			137744			116342				
Wald chi2 (p value)			105244.06 (0.00)			22880.65 (0.00)				
Pseudo R2			0.3203			0.3269				
Significance levels *** 1%, ** 5 %, * 10% are based on robust standard error.										
Source : Authors' calculations based on NSSO data										